

WHAT IS CLAIMED IS:

1. A network device, comprising:
a message receiving module operable to receive notify messages transmitted from controlled devices connected in a network;
a device list management module operable to collect information on the controlled devices connected in the network and create and manage a list of service information of all the controlled devices connected in the network; and
a control module operable to search for service information of a specific controlled device, which has been requested by a control point, in the device list management module and transmit the searched information.
2. The device as claimed in claim 1, wherein the message receiving module receives a search message transmitted from the control point.
3. The device as claimed in claim 1, further comprising a token management module operable to generate a token, transfer the generated token to another controlled device and manage the token.
4. The device as claimed in claim 3, wherein the control module responds to an information request message from the control point by checking whether the token is present in the controlled devices.
5. The device as claimed in claim 4, wherein the check of the presence of the token is performed using state information of the controlled devices.

6. The device as claimed in claim 5, wherein the state information is any one of an initial state, an active state and a stop state.

7. The device as claimed in claim 1, further comprising a timer management module operable to create a self-timer, wherein when a token managed by a token management module is transferred to another controlled device and the self-timer checks a response time of the other controlled device to which the token is transferred.

8. The device as claimed in claim 7, wherein the timer management module creates a waiting timer, and the waiting timer checks a total circulation time of the token for controlled devices existing in the network.

9. The device as claimed in claim 1, further comprising a negotiation module operable to control the validity of each token when a plurality of tokens are present in the controlled devices existing in the network.

10. The device as claimed in claim 9, wherein the negotiation module determines whether the plurality of tokens are present by using state information of each controlled device.

11. The device as claimed in claim 9, wherein the negotiation module is operable to control the validity of each token by comparing the numbers of controlled devices in lists of controlled devices stored in respective controlled devices having the tokens.

12. The device as claimed in claim 11, wherein if the compared numbers of controlled devices in the lists held by the respective controlled devices are the same, the negotiation module controls the validity of each token by comparing the sums of network remaining duration times of the respective controlled devices registered in the lists.

13. A network system, comprising:

a control point operable to transmit discovery packets to search for devices existing in a network, receive response messages thereto and control the devices existing in the network; and

controlled devices, each of which receives notify messages transmitted from other controlled devices connected in the network, generates and manages a list of information on all controlled devices connected in the network, and searches and transmits information on a controlled device requested by the control point.

14. The system as claimed in claim 13, wherein each controlled device comprises:

a message receiving module operable to receive notify messages transmitted from the controlled devices connected in the network;

a device list management module operable to collect the information regarding the controlled devices connected in the network and create and manage a list of service information of all the controlled devices connected in the network; and

a control module operable to search for service information of a specific controlled device, which has been requested by the control point, in the device list management module and transmit the searched information.

15. The system as claimed in claim 14, wherein the message receiving module

receives a search message transmitted from the control point.

16. The system as claimed in claim 13, wherein each controlled device further comprises a token management module operable to generate a token, transfer the generated token to another controlled device and manage the token.

17. The system as claimed in claim 16, wherein the control module responds to an information request message from the control point by checking whether the token is present in the controlled devices.

18. The system as claimed in claim 17, wherein the checking of the presence of the token comprises using state information on the controlled devices.

19. The system as claimed in claim 18, wherein the state information is any one of an initial state, an active state and a stop state.

20. The system as claimed in claim 16, further comprising a timer management module operable to create a self-timer, wherein when a token managed by a token management module is transferred to another controlled device, the self-timer checks a response time of the other controlled device to which the token is transferred.

21. The system as claimed in claim 20, wherein the timer management module is operable to create a waiting timer, and the waiting timer is operable to determine the total circulation time of the token for controlled devices existing in the network.

22. The system as claimed in claim 16, wherein each controlled device further comprises a negotiation module operable to control the validity of each token when a plurality of tokens are present in the controlled devices existing in the network.

23. The system as claimed in claim 22, wherein the negotiation module is operable to determine whether the plurality of tokens are present by using state information of each controlled device.

24. The system as claimed in claim 22, wherein the negotiation module is operable to control the validity of each token by comparing the numbers of controlled devices in lists of controlled devices stored in respective controlled devices having the tokens.

25. The system as claimed in claim 24, wherein if the numbers of controlled devices in the lists held by the controlled devices are the same, the negotiation module controls the validity of each token by comparing the sums of network remaining duration times of the respective controlled devices registered in the lists.

26. A method of providing a list of controlled devices, comprising:
receiving notify messages from controlled devices connected in a network;
collecting information regarding the controlled devices connected in the network through the received notify messages and generating the list of controlled devices;
receiving an information request message for a specific controlled device;
searching for information regarding the specific controlled device for which the information request message is received, in the generated list; and
transmitting the information regarding the searched specific controlled device.

27. The method as claimed in claim 26, further comprising generating a token by each controlled device.

28. The method as claimed in claim 27, wherein the searching is performed when the token is present in the controlled device as a result of checking whether the token is present in the controlled device.

29. The method as claimed in claim 27, further comprising transferring the token to another controlled device.

30. The method as claimed in claim 29, wherein the token transferring further comprises:

checking, by the controlled device, the number of controlled devices in the list of controlled devices stored in a device list management module of the controlled device;

if it is determined that the number of controlled devices in the list is more than 2, transferring the token and the stored list of controlled devices to another controlled device;

checking whether a response message is received from the other controlled device and operating a self-timer of the controlled device; and

if the response message is received from the other controlled device, stopping the self-timer and operating a waiting timer of the controlled device.

31. The method as claimed in claim 30, wherein the list transferring comprises modifying the list of controlled devices so the controlled device which has transferred the list becomes the last in the list, and identifying a controlled device, which has recorded as the

first in the modified list, as a controlled device to which the list will be transferred.

32. The method as claimed in claim 30, wherein the self-timer determines a response time of the other controlled device to which the token is transferred.

33. The method as claimed in claim 30, wherein the waiting timer determines the total circulation time of the token for controlled devices existing in the network.

34. The method as claimed in claim 30, further comprising:
if a token is not received from other controlled devices even after the operation of the waiting timer is completed, automatically generating a token.

35. The method as claimed in claim 30, further comprising, if the response message is not received from the other controlled device:

deleting, by the controlled device, the other controlled device, which has not transmitted the response message, from the list of controlled devices stored in the device list management module; and

notifying, by the controlled device, a control point that the controlled device, which has not transmitted the response message, does not exist in the network.

36. The method as claimed in claim 35, further comprising:
if the response message is not received from the other controlled device, transferring the token and the stored list of controlled devices to a further controlled device by the controlled device.

37. The method as claimed in claim 30, further comprising:
if a plurality of tokens are present in controlled devices existing in the network,
performing negotiation for controlling the validity of each token.

38. The method as claimed in claim 37, wherein the negotiation comprises:
controlling the validity of each token by comparing the numbers of controlled devices
in lists of controlled devices held by the respective controlled devices having the tokens.

39. The method as claimed in claim 38, wherein the negotiation further comprises:
if the numbers of controlled devices in the lists of controlled devices are the same as a
result of the comparison, controlling the validity of each token by comparing the sums of
network remaining duration times of the respective controlled devices registered in the lists.

40. A method of providing a list of controlled devices, comprising:
receiving, in a controlled device, notify messages from other controlled devices
connected in a network;
collecting information on the controlled devices connected in the network through the
received notify messages and generating the list of controlled devices;
requesting, by a control point, information on a specific controlled device;
searching for, by the controlled device, the information regarding the specific
controlled device requested by the control point, in the generated list; and
transmitting the information on the searched specific controlled device.

41. The method as claimed in claim 40, further comprising generating a token by
each controlled device.

42. The method as claimed in claim 41, wherein the searching is performed when the token is present in the controlled device as a result of checking whether the token is present in the controlled device.

43. The method as claimed in claim 41, further comprising transferring the token to another controlled device.

44. The method as claimed in claim 43, wherein the token transferring further comprises:

checking, by the controlled device, the number of controlled devices in the list of controlled devices stored in a device list management module of the controlled device;

if it is determined that the number of controlled devices in the list is more than 2, transferring the token and the stored list of controlled devices to another controlled device;

checking whether a response message is received from the other controlled devices and operating a self-timer of the controlled device; and

if the response message is received from the other controlled device, stopping the self-timer and operating a waiting timer of the controlled device.

45. The method as claimed in claim 44, wherein the list transferring comprises modifying the list of controlled devices so that the controlled device which has transferred the list becomes the last in the list, and identifying a controlled device, which has been recorded as the first in the modified list, as a controlled device to which the list will be transferred.

46. The method as claimed in claim 44, wherein the self-timer checks a response

time of the other controlled devices to which the token is transferred.

47. The method as claimed in claim 44, wherein the waiting timer checks the total circulation time of the token for controlled devices existing in the network.

48. The method as claimed in claim 44, further comprising:
if a token is not received from other controlled devices even after the operation of the waiting timer is completed, automatically generating a token.

49. The method as claimed in claim 44, further comprising, if the response message is not received from the other controlled device:

deleting, by the controlled device, the other controlled device, which has not transmitted the response message, from the list of controlled devices stored in the device list management module; and

notifying, by the controlled device, the control point that the controlled device, which has not transmitted the response message, does not exist in the network.

50. The method as claimed in claim 49, further comprising:
if the response message is not received from the other controlled device, transferring the token and the stored list of controlled devices to a further controlled device by the controlled device.

51. The method as claimed in claim 46, further comprising:
if a plurality of tokens are present in controlled devices existing in the network, performing negotiation for controlling the validity of each token.

52. The method as claimed in claim 51, wherein the negotiation comprises:
controlling the validity of each token by comparing the numbers of controlled devices
in lists of controlled devices held by the respective controlled devices having the tokens.

53. The method as claimed in claim 52, wherein the negotiation further comprises:
if the numbers of controlled devices in the lists of controlled devices are the same as a
result of the comparison, controlling the validity of each token by comparing the sums of
network remaining duration times of the respective controlled devices registered in the lists.